CLAIMS

What is claimed is:

1. A coolant system for a machining center having a cutting tool selectively engageable with a work-piece, the coolant system comprising:

a pump for supplying a flow of coolant to the cutting tool;

a motor drivingly engaging said pump;

a pressure transducer measuring the pressure of said coolant being supplied to the cutting tool, said pressure transducer outputting an electrical pressure signal;

a controller in communication with said pressure transducer and said motor, said controller comparing said pressure signal to a predetermined target pressure and varying the speed of said motor to minimize deviation of said pressure signal from said target pressure.

2. The coolant system of claim 1 wherein said controller determines the speed of said motor by using a proportional, integral, derivative closed-loop control system.

3. The coolant system of claim 1 further including an accumulator plumbed between said pump and said pressure transducer to attenuate pump and motor noise from said pressure signal.

4. The coolant system of claim 1 wherein said pump is a fixed displacement pump having a screw drive mechanism for displacing said coolant.

5. The coolant system of claim 4 wherein said motor is controlled by an alternating current variable frequency drive.

6. The coolant system of claim 1 wherein said predetermined target pressure is in the range of 40 to 50 P.S.I.

7. A coolant system comprising:

a first cutting tool having a first coolant path extending therethrough;

a second cutting tool having a second coolant path extending therethrough, wherein said second coolant path exits said second cutting tool at a location different from the exit location of said first coolant path, wherein only one of said first and second cutting tools is plumbed within said coolant system at one time and wherein said plumbed cutting tool is selectively engageable with a work-piece;

a pump for pumping coolant through one of said first and second cutting tools;

a motor drivingly engaged with said pump; and

a controller in communication with said motor, wherein said controller signals said motor to rotate said pump at a speed whereby said pressure between said cutting tool and said work-piece is substantially equal to a predetermined target pressure when either of said first cutting and second cutting tools is plumbed.

8. The coolant system of claim 7 further including a pressure transducer in communication with said controller and positioned proximate said plumbed cutting tool, wherein said pressure transducer provides an actual pressure signal to said controller for comparison to said predetermined target pressure.

9. The coolant system of claim 8 wherein said controller utilizes a proportional, integral, derivative algorithm to analyze said actual pressure signal and define said signal to said motor.

10. The coolant system of claim 7 further including a damping system for minimizing noise within the pressure signal generated by said motor and said pump.

11. The coolant system of claim 10 wherein said damping system includes an accumulator.

12. A method of controlling coolant flow comprising:

pumping coolant through a cutting tool;

engaging said cutting tool with a work-piece thereby creating resistance to the coolant flow;

setting a target coolant pressure to be obtained between said cutting tool and said work-piece;

measuring the coolant pressure supplied to said cutting tool;

comparing the measured coolant pressure to the target coolant pressure;

varying the flow rate of coolant pumped to minimize the difference between said target coolant pressure and said measured coolant pressure.

13. The method of claim 12 wherein the step of varying the flow rate includes coupling a motor to a pump and varying the rotational speed of said motor.

14. The method of claim 13 wherein said flow is varied linearly by rotating a fixed displacement pump.

15. The method of claim 12 wherein the steps of comparing and varying include analyzing the coolant pressure supplied using a proportional, integral, derivative closed-loop system.

16. The method of claim 12 further including the step of damping a noise signal generated during said pumping step.

17. The method of claim 12 further including the step of maintaining said minimal difference between said target coolant pressure and said measured coolant pressure during a machining operation regardless of the position of the coolant path through said cutting tool.